REMARKS

Reconsideration of this patent application is respectfully requested in view of the foregoing amendments and the following remarks.

The Examiner has rejected claims 1-12 under 35 U.S.C. 112 second paragraph.

Claims 1 and 2 have been canceled without prejudice. Claims 13 and 14 have been added and correspond to former claims 1 and 2 respectively. The remaining claims have been amended where necessary to overcome the other rejections.

The Examiner has rejected claims 1-12 under 35 U.S.C. 103(a) as being anticipated by U.S. Patent no. 3,864,542 to *Fletcher et al*.

The Examiner states that it would been obvious to complete the initial phase of the method of *Fletcher et al* within a predetermined period of time for purposes such as avoiding the overheating the workpiece.

It is respectfully submitted that *Fletcher et al* shows a welding method that is used especially for small diameter metallic tubing materials such as aluminum or stainless steel. With this design, to provide greater control of the granular structure of the weld zone, the frequency of DC welding voltage pulses applied to the electrode is slowly varied over predetermined range of frequencies. In this case, while the frequency variation of the DC welding voltage is being accomplished, the voltage across the electric arc gas voltage is monitored on a cathode ray oscilloscope.

In contrast to the teachings of the above cited reference, the present invention as claimed in claims 13 and 14 is directed to the phase between the ignition of an electric arc and a normal welding process. In addition, contrary to the present invention, the method according to *Fletcher et al* serves problems especially in the start phase that is after the ignition of the electric arc. This is because it is necessary to monitor the voltage across the electric arc during variation of the frequency of the DC welding voltage between zero and 10 *kHz*.

However, with the present invention, the initiation of the start program ensures that the melt bath produced will be set in

vibration and flows together so that the melt bath's of the two workpieces will be facilitated by the vibration of the melt. This step is of particular relevance to the extent that no additional material in the form of a welding wire is introduced into the melt. Instead, the weld seam is merely formed by the fused material, thus making it impossible to fill up the weld seam with an additional material.

Thus, it is not possible to solve the problem according to the present invention by the teachings of *Fletcher et al*. During the time phase where the frequency is varied over predetermined range of frequencies it is not possible to improve the quality of the weld in the start phase of welding process. Thus, it is respectfully submitted that remaining claims 3-14 are patentable of the above cited reference.

The Examiner has rejected claims 1-12 under 35 USC 103 (a) as being unpatentable over *Geissler et al*. The present invention as claimed in claims 13 and 14 differs from *Geissler et al* in that it is directed towards a process for use with a non-consumable electrode, wherein this process calls for liquid melt vibration, and in addition, this process calls for tack welding as disclosed in claim 14.

The reference to *Geissler et al* discloses a welding method with a controller for providing a constant current output in the welding range as well as providing an adaptive hot start that provides varying amounts of energy in response to the welders skill. The method according to FIG. 10 of *Geissler et al* refers to the time phase of the ignition of an electric arc between the electrode and the workpiece and not to the time phase after the ignition of the electric arc. During the ignition phase, there is no liquid melt bath which can be caused to vibrate as stated in the invention of claims 13 and 14.

In *Geissler et al.*, the period with a higher current as shown in FIG. 10 cannot be compared with the starting phase of the present invention of claims 13 and 14. For example, in *Geissler et al*, during that time rate of 150 ms, it would not be possible to cause the liquid melt bath to oscillate or vibrate. In contrast, the present invention as shown by example in the specification, the start program duration is between zero and 10 seconds which is sufficient time for the melt bath to oscillate or vibrate. Therefore, it is respectfully submitted that claims 13 and 14 are patentable over the above cited references taken either singly or in combination. In addition, it is respectfully submitted that dependent claims 3-12 which depend from claims 13

and 14 are also patentable over the above cited references.

In conclusion, claims 1 and 2 have been canceled without prejudice. Claims 3-14 remain in the application. Early allowance of the remaining claims is respectfully requested.

Respectfully submitted,
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DATE: October 23, 2006

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop: Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on October 23, 2006.

~~Kelly Espitia~~